DOCUMENT RESUME

ED 091 166 SE 017 328

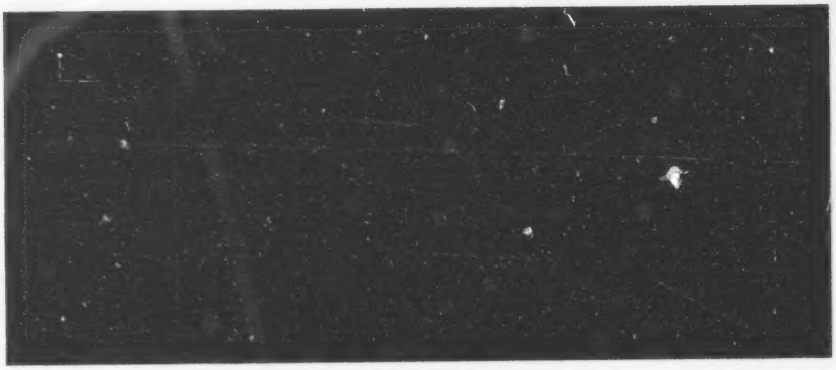
AUTHOR	Roth, Robert E.
TITLE	International and National Environmental Education: A Status Report - 1974.
INSTITUTION	ERIC Information Analysis Center for Science, Mathematics, and Environmental Education, Columbus, Ohio.
PUB DATE	26 Feb 74
NOTE	36p.; Address delivered to the American Nature Study Society affiliated with the American Association for the Advancement of Science (San Francisco, California, February 26, 1974)
EDRS PRICE	MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS	*Educational Programs; Educational Research; *Environmental Education; International Organizations; *International Programs; *Program Descriptions; *State of the Art Reviews; Teacher Education
IDENTIFIERS	United Nations; *United States

ABSTRACT

This report focuses on the current status of environmental education in the U.S. and a number of selected countries around the world. The scope and primary concerns of environmental education are defined, and the stimulus created by the United Nations Stockholm Conference on the Human Environment is discussed. On the international scene environmental program in Australia, Canada, Czechoslovakia, Ecuador, the Federal Republic of Germany, Italy, Japan, Malta, the United Kingdom, and Zambia are examined, and the contributions of the International Union for Conservation of Nature (IUCN) and UNESCO are outlined. Within the U.S. environmental education programs have changed significantly over the past decade (1964-74). Results of studies are presented to indicate the environmental attitudes and knowledge of tenth and twelfth grade students, the extent of environmental courses being offered in undergraduate college programs, and of environmental education courses available in teacher education institutions. Also discussed are exemplary program models, the designation of state environmental education coordinators, and the extensive environmental materials now available. The report concludes that the citizens of Spaceship Earth are becoming aware of their environmental responsibilities and are actively seeking the institutional arrangements, educational programs, and behaviors essential to securing a quality enviornment and life-style. (JR)

ED 091166

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION



SMEAC/SCIENCE, MATHEMATICS, AND ENVIRONMENTAL EDUCATION INFORMATION ANALYSIS CENTER

. . . an information center to organize and disseminate information and materials on science, mathematics, and environmental education to teachers, administrators, supervisors, researchers, and the public. A joint project of The Ohio State University and the Educational Resources Information Center of USOE.

SE 017 328

ED 091166

INTERNATIONAL AND NATIONAL ENVIRONMENTAL EDUCATION: A STATUS REPORT 1974

by

Robert E. Roth Ph.D.
Division of Environmental Education
School of Natural Resources
The Ohio State University
Columbus, Ohio

and

Associate Director
Environmental Education
ERIC/SMEAC

Address delivered to the American Nature Study Society affiliated with the American Association for the Advancement of Science.

San Francisco, California
February 26, 1974

ENVIRONMENTAL EDUCATION INFORMATION REPORTS

Environmental Education Information Reports are being issued to analyze and summarize information related to the teaching and learning of environmental education. It is hoped that these reviews will provide information for development personnel ideas for teachers, and an indication of trends in environmental education.

Your comments and suggestions for this series are invited.

Robert W. Howe
Director, ERIC/SMEAC

Sponsored by the Educational Resources Information Center of the National Institute of Education and The Ohio State University.

This publication was prepared pursuant to a contract with the National Institute of Education. Contractors undertaking such projects under Government sponorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent official National Institute of Education position or policy.

TABLE OF CONTENTS

		Pages
1.	Introduction	1
2.	International Aspects of EE	3
3.	EE Throughout the World	4
4.	International E^2 in Brief	17
5.	Bibliography	19
6.	Environmental Education in the United States	20
7.	Teacher Education	24
8.	State EE Coordinators	25
9.	Summary	29
10.	Conclusion	30
11.	Bibliography	31

INTERNATIONAL AND NATIONAL ENVIRONMENTAL EDUCATION: A STATUS REPORT - 1974

A decade after the inception of the third environmental wave (Udall, 1964) would seem to be a useful vantage point from which to assess a variety of dimensions related to environmental education at both the national and international levels. A world-view growing out of the layman's glimpse of earth by way of man's attempt to explore space and the solar system has dramatically changed the environmental perception and awareness of virtually all citizens of Spaceship Earth. In addition, an increasingly rapid growth of the use of technology has caused a major upheaval in the speed with which environments are being modified, new socio-economic problems created, and the rising level of expectations accelerated. The increasing emphasis on professional training, with vast bodies of facts to be assimilated, does not necessarily find accord with the vision of the world found among those who have lately become "environmentally conscious". What is desired is meaning in life and not routine, narrowly specialized disciplines that are often dictated by present educational and training programs.

Environmental education has developed rapidly in the past few years and has contributed greatly towards the shaping of necessary new approaches. It stresses interrelations and linkages and the role of man in managing properly the natural resources at local, national, regional and global levels. It is essentially interdisciplinary, and covers the social as well as the natural sciences.

This approach to education involves development of understanding: how the environment functions, how it is interrelated with man, how man affects his environment, and especially what are the short- and long-term consequences of his actions. It also involves the development of attitudes and ethics: the maintaining and enhancing of diversity, and keeping open options for future choice, leading to formulation of guidelines for behavior and action in relation to issues concerning environmental quality and ultimately contributing to better decision-making based on sound ecological principles (IUCN, 1972). Specifically, environmental education is concerned with developing a citizenry that is:

1. knowledgeable about the biophysical and sociocultural environments of which man is a part,
2. aware of environmental problems and management alternatives of use in solving those problems; and
3. motivated to act responsibly in developing diverse environments that are optimum for living a Quality Life.

(Roth, 1973)

Thus it can be seen that environmental education is concerned with knowledge of the universe, society, and the individual, in that it not only attempts to provide the individual with environmental understandings, but also views him as a potential creative being and encourages him to accept the responsibility of decision-making which is his by virtue of being human.

INTERNATIONAL ASPECTS OF EE

With the convening of the United Nations Stockholm Conference on the Human Environment in June of 1972, 113 nations of the world went on record as supporting the concept of "Only One Earth" (Ward, 1972) and the "Declaration of Human Rights" (1972) became a permanent part of the written record of mankind. Several years of thought, hard work, and politicing (in the best sense of the word) came to fruition under the aegis of the United Nations and the able leadership of Maurice Strong, the Secretary General of the New Environmental Secretariat. With the production of more than 70 national environmental reports and the development of 26 agreed upon principles, the stage was set for a flurry of activity as nations, organizations, scientists, and environmentalists began exploring ways to achieve the objectives produced in Stockholm.

A Declaration on the Human Environment was the initial document that specified the 26 principles and outlined arrays of recommendations involving: (1) Human Settlements Management; (2) Natural Resources Management; (3) General Pollution; (4) Educational, Informational, Social and Cultural Aspects; Governing Council for Environmental Programmes; Environmental Secretariat; and the Environment Fund. Out of this has grown the approval and establishment of the Environmental Secretariat in Nairobi, Kenya, the Environment Fund, and a variety of developmental thrusts as varied as the organizations within the U.N. itself. From appointment of Maurice Strang as the first Secretary-General of the

Environmental Secretariat, to the establishment of the position of Director of Environmental Education in UNESCO-Paris office and the significant involvement of IUCN (the International Union for the Conservation of Nature and Natural Resources), considerable interest, energy, and support is being directed toward environmental education on the international level. (Shaposhnikov, 1973).

EE THROUGHOUT THE WORLD

Australia

Several associations for environmental studies exist in Australia and lend support to the establishment of various centers for environmental studies. The State Department of Education operates eleven such centers, the major universities have a couple and a few independently operated centers exist as well. Interest in environmental education continues to grow and appropriate concepts and activities are being incorporated into the curricula of the elementary and secondary schools.

Canada - Broad Environmental Studies Programs Developing

Environmental studies are included in elementary and secondary programs in Canada as well as being a major area for undergraduate, graduate, and technical/vocational education. The Universities of Waterloo, Kalgery, Toronto, and York all maintain formal degree arrangements in environmental studies, science, or design. Some exemplary programs exist at the elementary and secondary levels as well, notably the

Yellow Knife curriculum in Manitoba, a program that is targeted on Eskimo children and permeates the entire curriculum, and the grade 10 program of the Science Section of the Nova Scotia Museum (Halifax) where field work, classroom materials and specimens and museum staff involvement are combined to study the marine environment.

Czechoslovakia - National Park Introduces Children to Conservation

Environmental education, of youth in particular, is one of the permanent tasks of the National Parks in the Giant Mountains, North Bohemia. A children's conservation camp was held in the area of the National Park from 7 to 18 August, 1972. Its aim was to stimulate interest in nature study and conservation among youngsters, to awake awareness of and active interest in environmental issues, and to acquaint children with the environment and importance of the National Parks. Forty-five boys and girls from the 6th to 8th grade inclusive were selected for participation by headmasters of schools within two districts on whose territory the Giant Mountain National Park lies. Food and accommodation during the camp was provided by the National Park Headquarters free of charge.

Ecuador - Galapagos Center Promotes Biological/Ecological Education

In late October and early November 1971, 40 teachers from primary and secondary schools on the Galapagos Islands took part in a course of lectures, demonstrations and excursions in the field of general biology and geology, and their special relation to the Galapagos archipelago. Part of the course was dedicated entirely to discussions on the quality of human

environment, to the concept of National Parks, and to the Galapagos National Park and its particular conservation problems. The Charles Darwin Station plans to offer its services to schools on the Islands as far as its very limited staff can find the time for it.

The Galapagos National Park is in a critical situation and destruction is increasing. It is believed that the promotion of biological education has a high priority and that the conservation of the wilderness areas left in the Galapagos Islands depends in the long run on the understanding and initiative of the inhabitants.

Federal Republic of Germany - Universities and Public Schools Participate in Environmental Studies

The Government of the Federal Republic of Germany is now trying hard to encourage environmental studies and research at universities. It is emphasizing that environmental courses should be obligatory especially for students in education, engineering, and technology.

At present there is no university in the Federal Republic where environmental studies are not included in the programmes in one way or another. New trends are being supported, for example through social and economic studies on the interrelatedness of human society and its environment, and through medical and biological research on the impact of biocides and other toxic chemicals released in the environment recently.

The University of Giessen, which developed after 1950 from an Agricultural Faculty, now offers a special inter-disciplinary oriented

programme of environmental studies. The new University of Trier-Kaiserslautern included environmental conservation as one of the most important items even at the planning stage of the Faculty of Science and Technology.

Various universities, including Darmstadt and Frankfurt, are planning to create special scientific centers for environmental problems and environmental research, which should integrate investigations in the fields of biology, geography, medicine, conservation and technology. About 600 field centers (nature study places) utilized by the educational institutions of the country focus on various phases of natural science like geology and caving which are related to other areas of the curriculum back in the school.

First School Introducing Special Course of Environmental Studies

Since the autumn of 1971 the pupils of the Theodor-Heuss-School in Baunatal near Kassel have a new option: from grade 7 they can choose 'Environmental Conservation' as one of their principal compulsory subjects - instead of a foreign language (French, Latin) or instead of technology, economics or science. By this decision they are obliged to follow their chosen subject for two years (four lessons a week).

This new project is being encouraged by the Federal Ministry of Education and Science in Bonn, and by a grant of 200.000 DM, most of which (135.000 DM) is being used for construction of an 'Environmental Station'.

Italy - First Italian Center for Environmental Education

On the initiative of the Italian National Federation PRO NATURA, with the active support of regional authorities and organizations, science teachers from the north Italian province of Aosta met in Aosta on 24 - 25 March 1972 to begin a series of discussion workshops on "School and Nature". Further gatherings scheduled later are expected to involve teachers of social science, literature, and fine arts. The interest among the participants of the first workshop in environmental educa on was immense, and the desire to institute a permanent centre for environmental education spontaneous and unanimous. The project is now being developed in consultation with IUCN Commission on Education.

Summer Work and Ecology Study Camps.

In 1972 the Abruzzo National Park took the initiative, for the first time in Italy, of organizing Summer Work and Ecology Study Camps which permitted young people interested in nature and conservation to obtain a brief but interesting insight into the problems. The Park Board, with the collaboration of the W.W.F. Italian National Appeal, organized three ten-day courses which took place in August 1971, and which were attended by 30 young people. The program provided, in addition to lessons, conferences and film shows, practical field experience in the care and revaluation of the environment and nature walks which took them into close contact with their surroundings, and the flora and fauna to be protected.

Japan - Outdoor Education and Recreation Emphasized

According to Kirk (1974) over one third of the Prefectures (states) government in Japan have operating environmental studies centers. Osaka is the site of the largest with a $10 million building. Considerable recreation is included in the programs of these centers.

Outdoor education programs for public schools have been developed recently. For example, Rokko Outing Activities Center in Rokko Mt. near Kobe city is becoming an outdoor education center for public school groups and various kinds of youth's groups. Osaka Outdoor Activities Center near Osaka city is also utilized for public school outdoor education programs throughout the year. Tanzawa Outdoor Education Center, in the Tanzawa Prefectural Park is a center for Yokohama city public-school students (from 7th to 9th grade). It was established in 1959 and opened in June of that year. About 3,000 junior high school students participated.

Leadership training is being emphasized throughout the country. The Ministry of Education and local Education Departments are sponsoring short training courses in outdoor education for school teachers and youth leaders. Similarly the National Recreation Association of Japan, Youth Hostel Association of Japan, and Joint Recreation Institute of YWCA and YMCA also provide short training courses for organized camps.

Several interesting trends are apparent in Japan and warrant attention (Ebashi, 1973):

1. The number of students who participate in school camping and outdoor education is increasing every year.
2. Program content is getting broader and understanding and appreciation of nature and conservation is becoming important phase as well as outdoor group living and skills for outing activities.
3. Local Education Departments are trying to develop their own camping sites and facilities for public school use.
4. The number of teacher training colleges requiring outing activities is increasing and various short training courses for organized camping and outdoor education are being held annually both public and private agencies.
5. Some big industries are providing organized camping experiences for their own youth workers.
6. The Youth Hostel movement is a growing field in Japan and every prefecture government is providing Youth Centers in natural settings for youth groups.

Malta - Training in Field Studies for Teachers

For a considerable time the Malta Bird Reserves Overseas Committee has realized the importance of holding a field course for Malta's teachers, such a course to consist of (a) studies suitable for carrying out in schools and (b) more advanced studies to increase the background knowledge of the

course members. In turn this should lead to a much improved 'school situation' and also the organizers hope to a greater awareness for the need to conserve the wild life of the Maltese Islands.

With the blessing of Malta s Department of Education a week-end preliminary course was planned for November 1971 to be followed by a course lasting for a whole week in April 1972. There was an excellent response from the teachers - 70 secondary teachers applied - 33 were accepted (the maximum number which could be accommodated, and the preliminary course, run by Mrs. P. Wolsey and Dr. S. Haslin, was an outstanding success. Practical work included the recording of environmental factors and transects from the salt marsh to the sand dunes at Ghadira.

United Kingdom - Environmental Studies Combined with Outdoor Pursuits

Many colleges are developing undergraduate majors in "Outdoor Pursuits and Environmental Studies" with an orientation comparable to what we know as "Outward Bound". According to Kirk (1973) a very high level of interest and support exists among the 47 college presidents he visited.

The National Association for Environmental Studies coordinates programs among local educational authorities at over 300 environmental studies centers in England and Wales. Program emphasis is on combining cultural geography and the natural sciences. Much emphasis appears to be placed on physical education and the elementary education programs.

A high degree of organization specialization, and innovation is apparent.

Zambia - National Conservation Poster Competition

The General Council of the Wild Life Conservation Society of Zambia announced, within the Zambia Conservation Year 1972, its National Conservation Poster Competition. This was open to three categories of participants: primary school children; secondary school pupils; and teacher-training college students. Entries were to be the un-assisted works of the competitors. Any technique could be used, but not more than four poster colors; captions on the entries were to be in any Zambian language or in English. The organizing Society has also announced a list of topics, for which posters could be designed. They cover the whole scope of environmental conservation, ranging from "Being Kind to Dumb Animals" and "Knowing Beneficial Birds", through "Preventing Grassland Fires" and "Avoiding Air Pollution", to "Man and His Environment--Their Interdependence".

The IUCN and Environmental Education

IUCN through its Commission on Education and in collaboration with its sister organization, World Wildlife Fund, is actively involved in promoting environmental education and has been since the Commission came into existence in 1949. A series of conferences and seminars has brought the need for special action in this field strongly before governments and there is now acceptance in many countries of the environmental education approach, at primary, secondary and tertiary levels.

The most recent of such major regional meetings was the first European Working Conference on Environmental Conservation held at Ruschlikon near Zurich, Switzerland, in December 1971. Conclusions of the Conference have been accepted by many agencies as the basis for their educational activities.

UNESCO has been concerned with this work, particularly since its ground-breaking "Biosphere" Conference in 1968, and IUCN has received its support in cooperative projects. FAO, particularly through its Forestry Department, is also committed to work in environmental education.

Current IUCN concern is with curriculum building, teaching methodology, text books and other teaching aids. Much of the factual basis for environmental education is available from scientists but translation into teaching practice adapted to local conditions involves the active cooperation and participation of all groups in education: decision makers, educational scientists, and teachers.

An acceptable base for curriculum development was evolved at an IUCN working meeting held in Nevada, USA, in 1970 and this has since been used by a number of countries in producing their own environmental-oriented curricula. It has been possible to adopt existing content in a new structural grouping without causing over-crowding with new subject matter.

Teacher training courses have also been promoted by IUCN including in 1972, one held in Wilhelminaoord, Netherlands, for teachers from

northwest Europe and another in Wales that included participants from countries outside Europe (IUCN, 1972).

As a result of these activities, IUCN has produced a methods handbook for use in primary and secondary schools that is ready for publication. Other publications are in preparation (Saveland, 1973).

The future alignment of IUCN involvement in formal education was explored at a workshop on new developments in this field, with special emphasis on higher education and teacher training, at London, Ontario, Canada in September 1973.

Although these projects have produced promising results, much remains to be done. The broad acceptance of the environmental approach in education in Europe and North America must be carried through to practical commitment at all levels and inevitably this will take much time and effort. Development of teaching materials, reorganization of programs, and teacher training will not be completed quickly.

Man and the Biosphere Programme (MAB)

UNESCO has also established a major thrust in environmental concerns by establishing the MAB Programme and lending support to efforts of other organizations like IUCN and WWF mentioned above.

The structure of the Man and Biosphere Programme, with its National Committees and its International Co-ordinating Council, provides an important facility - among other - for scientific cooperation at the

intergovernmental level (UNESCO, 1973). The MAB Programme is primarily a programme of interdisciplinary environmental research. However, since the research proposed under the Programme depends on the existence of teams of trained research workers and since one of the objectives of the Programme is to promote environmental education in its broadest sense, MAB must necessarily be closely associated with the problems of education and training.

At its first session in November 1971, the Internation Coordinating Council discussed the problems of environmental education in the broad sense, but it was not able to direct sufficient attention to defining the details on how MAB should exercise its functions in this field. The main objective of the panel meeting was therefore to try to delimit the education and training activities that are specific for MAB and define what MAB, given its nature and infrastructure, can and should do within the broad field of environmental education.

The panel met at UNESCO Headquarters in Paris from 5 to 8 December, 1972. The general terms of reference of the panel were: "to study the nature and content of educational and training activities that should be promoted under the MAB Programme". Emphasis was given to the types of actions and procedures needed for the training of the different types of specialists required for the implementation of MAB research projects. The recommendations made by the panel in this

regard were based on the following considerations:

- necessity of constantly linking this training with MAB research projects;
- need to emphasize the interdisciplinary nature of this training;
- need for close collaboration between the natural and social sciences;
- need for regionalization of training and information exchange activities;
- coupling, in training as in research efforts, of the efforts of industrialized and developing countries.

Regarding the immediate training requirements for MAB, special attention was given to the organization and promotion of post-graduate interdisciplinary training courses. These courses would generally be from 6 up to 10 to 12 months duration and include both theoretical and applied aspects aimed at bringing about greater rapprochement between the natural and social scientists. They will attempt to provide junior scientists with the approach necessary for their integration in interdisciplinary research projects.

Some attention was also given to the needs for training courses for technicians and for different types of seminars, including research seminars, training and information seminars and short courses.

Concerning the general aspects of teaching of the ecological and environmental sciences, it was suggested that the structure of the MAB Programme be used at each possible opportunity to improve the form of this teaching. Thus, the MAB National Committees could develop close

relations with national bodies involved in curricula innovation, with a view to orientating the work of the latter relative to environmental education; the stations and sites associated with MAB research might be used for demonstration and popularization of environmental subjects.

The organization by UNESCO of a symposium on the methodology of environmental education was discussed also.

International E^2 in Brief

Based upon the preceeding it is possible to suggest the following concerning the character of international involvement with environmental education:

1. Most participating countries in the Stockholm Conference have taken steps to develop some form of environmental management and education program;
2. Environmental education is perceived to be most closely allied with nature study and environmental studies in the more traditional disciplinary sense;
3. New courses and programs are being promoted and developed within the usual limitations of budget, personnel, and facilities;
4. Considerable effort is being generated at the college and university level as evidenced by programs previously described;
5. Environmental Education for the lay person is being developed in a variety of forms from a recreation orientation to special programs by both public and private agencies and organizations;

and

6. Broad based organizations like UNESCO and IUCN are actively defining and developing thrusts that will be of considerable utility in achieving the goals established by the 1972 Stockholm Conference.

Bibliography

1. Ward, Barbara and Rene Dubos. 1972. Only One Earth: The Care and Feeding of Our Small Planet. W.W. Norton. New York. 275 pp.

2. Environment Stockholm 1972. Centre for Economic and Social Information, U.N. European Headquarters, Geneva, Switzerland.

3. Udall, Stewart. 1963. The Quiet Crisis. Holt, Rinehart and Winston, New York. 209 pp.

4. Roth, Robert E. 1973. "A Model for Environmental Education", The Journal of Environmental Education, Winter. p.38-39.

5. Kirk, John. 1974. Personal conversation following his outdoor education lecture tour in Europe, Japan, and the United Kingdom.

6. Ebashi, Shinshiro. 1973. "Outdoor Education and Camping in Japan". Report for New Jersey State School of Conservation, Branchville, N.J.

7. International Union for Conservation of Nature and Natural Resources. 1972. International Course for Teacher Training in Environmental Conservation and Education. IUCN, 1110 Morge Switzerland.

8. Saveland, Robert N. 1973. Handbook on Environmental Conservation Education. IUCN. 1110 Morge Switzerland (1st Draft Edition).

9. UNESCO. 1972. Expert Panel on Educational Activities under the Man and the Biosphere Programme (MAB). Final Report #7, UNESCO, Paris.

10. IUCN. "Bulletin" Vol. 3, No. 8.

ENVIRONMENTAL EDUCATION IN THE UNITED STATES

The status of environmental education in the United States has changed significantly over the past decade (1964-1974). Programs and projects funded by Title III of the Elementary and Secondary Education Act emphasizing outdoor education were the first major emphases in American education. The recent set of guidelines from the U.S. Office of Environmental Education (1974) highlights development of research, demonstration and pilot programs based upon the impact of scientific and technological findings, human settlements, food production, energy production, and population dynamics, as well as air, water, and land use and related life support resources, for purposes of educating various targeted audiences. As the area of environmental education becomes more precisely defined there appear to be three major foci that emerge. Lucas (1972) identified the referents as ". . . . education in the environment, education about the environment and education for the the environment." It is interesting to note that the MAB Program of IUCN (1972) mentioned previously utilized the Lucas referent for purposes of program delineation. A conceptual base concerning education "for" the environment which is consistent with the Lucas referent was also developed by this writer previously (Roth, 1970) to provide a foundation for further work. The 1974 OEE Guidelines clearly embrace the spirit of the Stockholm Conference, the conceptual base, the referent of education for the environment.

National Assessment

Perkes (1972) and Bohl (1974) conducted studies designed to acquire baseline data about 10th and 12th grade students' environmental knowledge and attitudes and to study the relationship of attitudes and knowledge to variables that would be of interest in evaluative measures.

The staff of the ERIC Clearinghouse for Science, Mathematics, and Environmental Education and selected consultants developed three forms of an inventory which contained items requiring knowledge of specific facts and general concepts of the environment. Also, several items elicited students' attitudes about certain aspects of the environment.

The inventory was administered to a maximum of 30 tenth grade students and 30 twelfth grade students from 199 schools which were randomly selected from the Great Lakes states of Illinois, Indiana, Michigan, Ohio, and Wisconsin; and the Far West states of Alaska, California, Hawaii, Nevada, Oregon, and Washington.

It was found that males scored significantly higher than females on items requiring knowledge of facts, but not on items dealing with general environmental concepts. Twelfth graders scored significantly higher than tenth graders on the environmental concept items. But not on the items requiring knowledge of environmental facts.

In regard to attitudes, differences were found based on sex and grade level. However, the calculation of a chi square statistic using proportions instead of the total number of cases indicated that proportional differences were slight.

The size of the community where respondents lived and went to school was not significantly related to knowledge of environmental facts and concepts, but was related to items requesting the respondent to identify what he thought to be the major environmental concern of the community. Using a forced choice technique, there was a positive relationship between the size of community and the selection of pollution as the major community problem. However, this trend was reversed in cities over 100,000 population and concerns seemed to change toward sociological, crime and/or health related topics.

State of residence was also related to what was considered to be the major environmental concern in the community. California respondents selected air pollution; Wisconsin respondents were more concerned with water pollution; and respondents from Hawaii considered land-use to be of major importance.

Due to the large student sample used in this study (10,264), few significant relationships should have gone undetected. Also, where no relationships were found, it is highly probable that replication would produce similar results. Bohl's results parallel that of Perkes utilizing a different array of states, in fact the variation in data is less than 2 percent. It can be concluded that the youth of the U.S. have a positive attitude toward environmental management, but have little idea as to how or where things can be changed to achieve a satisfying quality environment.

Colleges and Universities

A study presently being concluded at ERIC/SMEAC inventoried 2800 two and four year undergraduate programs in the United States (1974) to determine the extent of environmental education programs and courses being offered. An 85% response was received providing 70% useable instruments. Based upon preliminary analysis, four conclusions can be stated at this point:

1. Extensive change has occurred from 1969-1972 in the number of new environmental courses being offered. Care must be taken to differentiate between new courses, and old courses that have simply been subjected to name changes;
2. Emphasis has been placed on establishing college, institute, school, and cross disciplinary environmental programs. As of August 1973, about 255 institutions of higher education have followed such a pattern;
3. The variety of course offerings increases as the size of the institution increases. Notable exceptions occur only in such specialized situations like Evergreen and U. of Wisconsin, Green Bay;
4. Many small institutions are offering some kind of course or program. However, technical and/or vocational education programs are not always available where needed. Individuals attending such institutions don't go too far from home and as such may not have

access to courses or programs that are needed. One preliminary recommendation that follows would seem to be that a needs assessment in each state, and especially in urban areas, should be conducted for a determination of the kinds and arrangement of courses and programs needed. Such a function could be part of the state plan for environmental education (Rocchio and Lee, 1973).

Teacher Education

Through ERIC/SMEAC (1974) a questionnaire was sent to 900 four year teacher education institutions to inventory the extent of environmental education programs and courses. The survey had a 79% response providing 65% useable returns.

Of the 580 returns processed, about 100 institutions indicated they had a course or program in environmental education. Of those indicating such a course or program it seems likely that 25-30% could be categorized as offering only a course. Similarly it should be pointed out that "outdoor education" was not specified by some that had such a course, but this kind of omission is double checked by examination of catalogs from each institution.

It can be concluded from this brief, and as yet incomplete, status survey that there are few programs in environmental education aimed specifically at pre-service teacher education. About 100 institutions do have a minor program consisting of 24-30 hours of course work. Few institutions have a certification program and most prefer a minor area of concentration.

A survey recently conducted by Dr. Sigmund Abeles of Connecticut State Department of Education (1973) inventoried certification in 47 states and found that one state, Wisconsin, has secondary certification in environmental education and none has it at the elementary level. In addition, seven states favor certification while 23 oppose it, with 17 giving "no response" to the question. Three states indicate a separate course in environmental education or ecology as a requirement for elementary teachers: Montana, Oregon, and Wisconsin. Two indicate a course requirement at the secondary level and those are Wisconsin and Oregon. Five states indicate interest in developing a course requirement as "supplemental" or "minor area" certification and those are Washington, Nebraska, Oklahoma, Maine, and Illinois.

State EE Coordinators

A communication network is maintained with the state environmental educators by ERIC/SMEAC. There is at least one designated for such responsibility in each of the 50 states, Washington, D.C. and Guam. The range of assigned time devoted to environmental education varies from 100% to 0 with most on half time and combining the function with supervision in science education. Information on new materials, products, and research is disseminated to the state coordinators and they in turn provide a great deal of information to the ERIC Center in return. A recent product in which this system functioned was the

production of a five volume set of "State Books" (Disinger and Lee, 1973) that describes exemplary program models, state planning activity, and personnel involved in environmental education.

Exemplary Program Models

In a study conducted by Helgeson and Helburn (1971), existing environmental education programs in public schools were analyzed. Results of the investigation indicated that there were relatively few operational programs in the United States compared to either the number of school districts, or more significantly to the number of school buildings. Programs designed for grades K-12 were few in number while more programs existed at either the elementary or secondary level.

Disinger and Lee (1973) describe 296 projects and programs in the second edition of the ERIC/SMEAC directory of environmental education programs at the elementary and secondary levels. Examples included that are noteworthy as models by type are as follows:

1. State Plan: The New Jersey Council for Environmental Education under the direction of Dr. Edward Ambry has developed a statewide approach to environmental education, consisting of K-12 curriculum development, college and university curriculum development, involvement of citizen action and business and industry groups, teacher in-service and pre-service education, materials production, and evaluation.

2. Title III E.S.E.A.: The Maine Environmental Education Project under direction of Dr. Dean Bennett is patterned after Stapp's (1965) environment encounter program but applied to four K-12 demonstration projects covering a wide geographic area;
3. Public Law 91-516: A National Demonstration Project for Self Learning and Community Involvement under direction of Dr. Don Stotler, Portland, Oregon was developed to serve as a stimulus in helping people of all ages to know about environmental problems, alternative solutions and to motivate action to solve these problems. Few materials are produced with major emphasis on personal involvement and consultation;
4. Local Project: The Worthington, Ohio City Schools under direction of Mr. Dean Freund introduces environmental and outdoor education philosophy, methods, and materials to area teachers via a locally funded center and resident environmental education program.

Many other models exist and are worthy of mention, but I commend Disinger's publication to your attention for further information and detail.

Materials

Materials produced in relation to environmental education are extensive in amount, are available in both print and non-print form, and are improving in quality. Most, however, do not appear to be interdisciplinary and often lack concepts related to the social sciences or humanities.

Similarly, urban oriented materials are few in number and most city schools have not developed materials oriented to their milieu.

New products developed by ERIC/SMEAC in response to demand from users, state coordinators, various professional organizations, practitioners, and researchers that might be of interest are as follows:

1. Modules I and III: A set of 80 slides and tape entitled "The Earth and Nothing More," designed to define environmental education and present the scope of the topics involved and a related set of 100 activities that are keyed by concept, subject matter, and grade level.
2. A Review of Research Related to Environmental Education by Roth and Helgeson that reviews 94 existing research studies and identifies areas for further investigation;
3. Nine bibliographies dealing with abstracted, annotated, and cited print, and non print materials by topic for educational use, e.g. Air Pollution, Water Pollution, Land Use, Population, etc.
4. Targeted information sheets to audiences like elementary and secondary teachers and administrators, college and university teachers and administrators, librarians, community action groups, and professional societies; and
5. Compilations and related micro libraries of microfiche studies contained in the ERIC system.

Summary

Environmental education has undergone extensive change in refinement of definition and application in the United States. As can be detected from the foregoing report, several statements can be made that characterize the present status as follows:

1. Environmental education has become most closely identified with the referent: "education for the environment";
2. As determined by the National Assessment, the youth of the U.S. have a positive attitude toward environmental matters, are oriented toward regional problems and related knowledge areas, but have little understanding as to the means for effecting change;
3. Colleges and universities are developing courses and programs to meet the environmental challenge, but further needs assessment in this regard by state would seem to be useful;
4. Teacher education has developed few degree certification programs in environmental education and most teacher education institutions prefer a minor area approach;
5. All 50 states, Washington, D.C., and Guam have designated environmental education coordinators usually devoting about half-time to the area;
6. Many program models exist and are presently operating under funding from federal to local sources;

7. Materials of both a print and non-print nature abound, but further emphasis is needed in the socio-cultural domain.

Conclusion

Environmental Education has made significant growth in the U.S. and abroad during the decade 1964-1974 as evidenced by the preceeding report. It would seem that the citizens of Spaceship Earth are becoming aware of their environmental responsibilities, and are actively seeking the institutional arrangements, educational programs, and behaviors essential to securing a quality environment and life style. The problems and opportunities that remain before us are enormous, but the challenge is clear as Leopold (1972) reminds us: "Ours is not a job of building roads into lovely countryside, but of making inroads into the still unlovely human mind."

Bibliography

1. Abeles, Sigmund. 1973. Teacher Certification in Environmental Education. Connecticut State Department of Education, Springfield, Connecticut.

2. Bohl, Walter Benson. 1974. A Survey of Environmental Knowledge and Attitudes of Tenth and Twelfth Grade Students from Four Southwestern States, Six Mideastern States and Twelve Plains and Mountain States. Unpublished Ph.D. Dissertation The Ohio State University, Columbus, Ohio.

3. Disinger, John F. and Beverly M. Lee. 1973. A Directory of Projects and Programs in Environmental Education for Elementary and Secondary Schools, ERIC/SMEAC. The Ohio State University, Columbus, Ohio.

4. Disinger, John F. and Beverly M. Lee. 1973. State Directories in Environmental Education, Vols. I-V, ERIC/SMEAC, The Ohio State University, Columbus, Ohio.

5. ERIC/SMEAC. 1974. A Survey of Environmental Education Programs and Courses in American Two and Four Year Undergraduate Colleges and Universities. (Study in progress). The Ohio State University, Columbus, Ohio.

6. "Financial Assistance for Environmental Education Projects." 1974. Federal Register. The National Archives of the United States, Washington, D.C.

7. Helgeson, Stanley H. and Nicholas Helburn et al. 1971. A Review of Environmental Education for Elementary and Secondary School Teachers. National Center for Educational Research and Development, U.S.H.E.W. Washington, D.C., Vol. I-III.

8. Leopold, Aldo. 1972. A Sand County Almanac and Sketches Here and There. Oxford University Press, New York.

9. Lucas, Arthur M. 1972. Environment and Environmental Education: Conceptual Issues and Curriculum Implications. Unpublished Ph.D. Dissertation. The Ohio State University, Columbus, Ohio.

10. Perkes, A. Cordell. 1973. A Survey of Environmental Knowledge and Attitudes of Tenth and Twelfth Grade Students from Five Great Lakes and Six Far Western States. Unpublished Ph.D. Dissertation. The Ohio State University, Columbus, Ohio.

11. Rocchio, Richard and Eve Lee. 1973. Planning for Environmental Education: The Nations Experience 1970-73. Center for Research and Education. 2110 E. 17th Ave., Denver, Colorado.

12. Roth, Robert E., Milton O. Pella, and Clay A. Schoenfeld. 1970. Environmental Management Concepts - A List. Research and Development Center for Cognitive Learning. University of Wisconsin.

13. Roth, Robert E. and Stanley L. Helgeson. 1972. A Review of Research Related to Environmental Education. ERIC/SMEAC, The Ohio State University, Columbus, Ohio.

14. Stapp, William B. Integrating Conservation and Outdoor Education into the Curriculum (K-12), Burgess Publishing Company, Minneapolis, Minnesota.